

REMARKS

Claims 1 and 8 have been amended. Claims 6 and 7 have been canceled. New claims 16-28 have been added. Thus, claims 1-5 and 8-28 are now pending in the present application. Support for the amendment to claim 1 may be found in original claims 6 and 7. Support for new claims 16-28 may be found in the specification as filed at pages 4-9. Thus, no new matter has been added. Reconsideration and withdrawal of the present rejections in view of the comments presented herein are respectfully requested.

Rejection under 35 U.S.C. §102(e)

Claims 1, 3, 4, 9-11, 14 and 15 were rejected under 35 U.S.C. §102(e) as being anticipated by Kinsho et al. (US 6,746,818). Claim 1 as amended recites the features recited in canceled claims 6 and 7 which were not rejected as being anticipated by this reference. Thus, claim 1 as amended is also not anticipated by this reference.

In view of the amendments and comments presented above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §102(e).

Rejections under 35 U.S.C. §103(a)

Kinsho et al. (US 6,746,818)

Claims 2, 5, 12 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kinsho et al. (US 6,746,818).

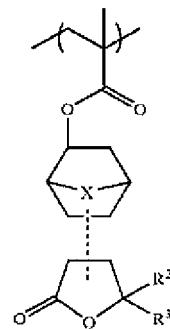
As discussed above, Claim 1 as amended recites the features recited in canceled claims 6 and 7 which were not rejected as being anticipated by this reference. In addition, neither claim 6 nor claim 7 was rejected as being obvious over Kinsho et al. alone. Thus, all of the claims which depend either directly or indirectly on claim 1, including claims 2, 3, 12, and 13, are necessarily patentable over Kinsho et al. alone.

Kinsho et al. in view of Uetani et al. (US 20010046641)

Claims 6-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kinsho et al. (US 6,746,818) in view of Uetani et al. (US2001/0046641). As discussed above, the limitations of Claims 6 and 7 have been incorporated into Claim 1. Thus, this rejection will be discussed in connection with Claim 1.

Claim 1, as amended, recites a polymer comprising at least one structural unit (a1) containing a lactone represented by one of the general formulas (1) through (4), and a structural unit (a3) which contains a hydroxyl group and is derived from a (meth)acrylate ester, wherein said structural unit (a3) is one or two units selected from a group consisting of general formulas (IV) and (V).

Kinsho discloses a polymer which comprises repeating units represented by a general formula (6).



The Examiner alleges that:

A resin containing such repeating unit (i.e., the unit derived from 3-hydroxy-1-adamantyl-(meth)acrylate) is known in the art to improve adhesion of the resist composition to a substrate. It would have been obvious to one skilled in the art to further include the repeat unit of 3-hydroxy-1-adamantyl-(meth)acrylate in Kinsho's polymer in order to further enhance the adhesion of his resist composition onto a substrate.

However, Kinsho does not disclose or suggest a unit which corresponds to the structural unit (a3) which contains a hydroxyl group and is derived from (meth)acrylate ester as recited in claim 1 as amended. Since this structural unit (a3) is not disclosed by Kinsho, then Kinsho also necessarily does not disclose or suggest that the structural unit (a3) is one or two units selected from a group consisting of general formulas (IV) and (V) as recited in claim 1 as amended.

Uetani describes a resin comprising a polymeric unit represented by the formula (I), a polymeric unit represented by the formula (II) such as 3-hydroxy-1-adamantyl-(meth)acrylate, and a polymeric unit derived from unsaturated dicarboxylic acid anhydride selected from maleic anhydride and itaconic anhydride (see paragraph [0021]).

As described in paragraph [0007] of Uetani, adhesion to a substrate is improved by using a resin having a polymeric unit derived from 2-alkyl-2-adamantyl-(meth)acrylate, a polymeric unit derived from unsaturated di-carboxylic acid anhydride, a polymeric unit derived from

alicyclic olefin and the like as a part of the polymeric units in the resin composing a chemical amplifying type positive resist composition. These effects are obtained by using this specific resin which enhances the above effect (adhesion to a substrate). Therefore, in order to achieve this effect, Uetani teaches the importance of using this specific resin.

Thus, Uetani teaches that improvement of adhesion to a substrate cannot be achieved only by including a unit derived from 3-hydroxy-1-adamantyl-(meth)acrylate. This effect requires the entire specific resin above in which a unit derived from 3-hydroxy-1-adamantyl-(meth)acrylate is also included in the resin.

Therefore, it would not be obvious to use only a unit derived from 3-hydroxy-1-adamantyl (meth)acrylate as described by Uetani, rather than the entire resin, in the invention of Kinsho, the objective of which is to provide a (meth)acrylate compound having a lactone structure useful as a monomer to form a polymer for use in the formulation of a photoresist composition which exhibits firm adhesion and high transparency, to arrive at the presently claimed invention.

In addition, a resin that comprises the polymer recited in claim 1 as amended can achieve the following unexpected effects:

This positive resist composition can suppress the occurrence of surface roughness such as line edge roughness that occurs within a resist pattern, either following etching or following developing, or preferably following both processes. The post-etching surface roughness suppression effect is particularly powerful.

(Emphasis added) Present specification at page 28, fourth paragraph.

[U]sing a structural unit represented by the aforementioned general formula (IV) and/or (V) as the structural unit (a3) increases the dry etching resistance and improves the verticalness of the pattern cross-sectional shape when the polymer is used within a positive resist composition, and is consequently preferred.

(Emphasis added) Present specification at page 15, last paragraph and page 16, first paragraph.

Thus, it is clear that the structural unit (a3) represented by the general formula (IV) or (V) plays an important role in providing a resist composition that is capable of suppressing the surface roughness that occurs within a resist pattern, either or both following etching or/and following developing, particularly within a resist pattern following etching.

Furthermore, in Examples of the present application, a structural unit corresponding to the structural unit (a3) represented by the general formula (IV) or (V) is included in the

component (A), and it is also clearly disclosed in Examples that the effect described above can be achieved by containing such components.

These unexpected results could not have been predicted based on Kinsho et al. or Uetani et al. either alone or in combination and would effectively rebut any case of *prima facie* obvious if one were present.

In view of the amendments and comments presented above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a).

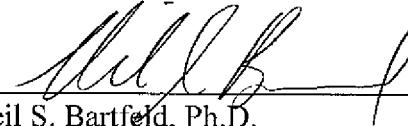
CONCLUSION

Applicants submit that all claims are in condition for allowance. Should there be any questions concerning this application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

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By: 
Neil S. Bartfeld, Ph.D.
Registration No. 39,901
Agent of Record
Customer No. 20,995
(619) 235-8550

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